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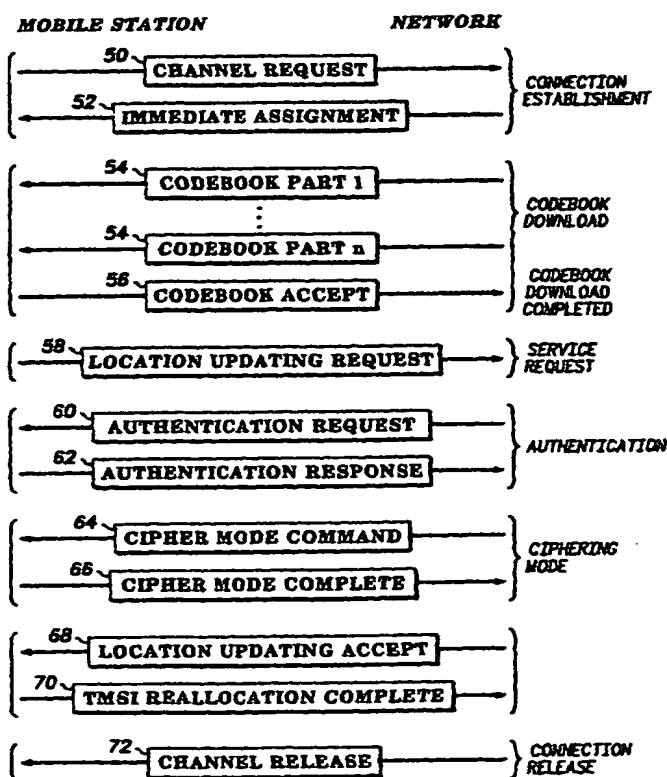
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(54) Title: MOBILE STATION, RADIO TELECOMMUNICATION SYSTEM AND METHODS FOR OPERATING RADIO TELECOMMUNICATIONS SYSTEMS



(57) Abstract: The invention provides methods and apparatus, including mobile stations to enable the mobile station to encode and/or decode messages, for example messages broadcast by the base station on a broadcast channel. The encoding and decoding is based on a set of rules downloaded to the mobile station into an area of application space or storage dedicated to this function.

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Mobile station, radio telecommunication system and methods for
operating radio telecommunications systems

5 **Technical Field**

The present invention relates to the field of telecommunication systems and is particularly, but not exclusively, applicable to the invention relates to mobile radio communication systems, such as those envisaged in the GSM
10 (Global System for Mobile communications) or UMTS (Universal Mobile Telecommunications Standard).

Background

15 Mobile or portable cellular telephones are typically arranged to communicate via a radio link to a base station of a network. Alternatively, a mobile telephone may communicate directly with a satellite.

Increasingly, cellular radio communications technology is being built into
20 other devices. These include portable 'lap-top' or 'notebook' computers and 'personal digital assistants'. These devices can then also send data or voice over cellular communications networks.

In future, practically any device may be able to communicate over a cellular
25 communications network.

An analogous form of technology to the cellular telephone consists of digital portable and mobile radios with private networks. These are commonly referred to as 'PMR' radios. Portable and mobile radios may be arranged
30 either to communicate with one another via base stations, or directly with one another in 'direct mode'. The communication will typically either be over a

digital simplex communication channel, or over a digital semi-duplex communication channel.

Mobile communications devices are commonly referred to as 'mobile stations'. In the following, the term mobile station will be used to describe any such electronic device capable of transmission and reception of voice and/or data including cellular transceivers (both terrestrial and satellite) and radio pagers.

10 The next generation of mobile stations will operate in accordance with a standard referred to as the universal mobile telephone standard (UMTS). The UMTS infrastructure will offer varying levels of service for UMTS mobile stations.

15 One goal of UMTS is the efficient use of the bandwidth associated with the limited radio spectrum available to system operators. Another goal is the orderly function of a variety of different levels of service offered by the network. A further goal is supporting a wide variety of UMTS mobile stations with varying capabilities. For example, whilst a UMTS cell might offer the possibility for a mobile station to transmit video imagery, many mobile stations operating within that cell may not be capable of transmitting or receiving video imagery.

25 In cellular telecommunication systems, such as GSM and UMTS, the broadcast capacity is limited for a number of different reasons. In the case of GSM, the original system design makes it difficult to extend the control channel overheads specified with the existing standard. The broadcast channels use spectrum for non-chargeable purposes. This may be seen as undesirable by an operator. The problem of broadcast capacity is a particular problem for multi-mode systems, in which there is a need to broadcast information about several modes, thus utilising significant amounts of the bandwidth allocation.

Summary of the Invention

- 5 The above object is met by the combinations of features of the main claims, and the dependent claims disclose further advantageous embodiments of the invention.

According to a first aspect of the invention there is provided a mobile station
10 for communicating with a radio telecommunications system, the mobile station comprising:

- means for communicating with the radio telecommunications system;
- means for storing rule information relating to predetermined
15 coding rules;
- means for retrieving said rule information;
- means for decoding, using the retrieved rule information, signals received from the radio telecommunications system .

20 According to a second aspect of the invention there is provided a mobile station for communication over a telecommunications system, the mobile station comprising:

- means for communicating with the radio telecommunications system ;
- 25 means for storing and retrieving rule information relating to predetermined coding rules;
- means for encoding, using the retrieved rule information, signals to be transmitted to the radio telecommunications system .

30 According to a third aspect of the invention there is provided a first mobile station for communicating with second mobile station in a telecommunications system, the first mobile station comprising:

means for storing rule information relating to predetermined coding rules;

means for communicating with the second mobile station;

means for retrieving said rule information;

5 means for encoding or decoding, using the retrieved rule information, signals to be transmitted to or signals received from the second mobile station, which signals use the predetermined coding rules.

10 According to a fourth aspect of the invention there is provided a radio telecommunications system comprising:

at least one base station;

at least one mobile station;

15 the at least one base station including means for transmitting signals to and means for receiving signals from the at least one mobile station;

the at least one mobile station including means for receiving signals from and means for transmitting signals to the at least one base station;

20 the mobile station including means for storing rule information relating to predetermined coding rules;

the mobile station also including means for retrieving said rule information; and

25 the mobile station further including means for decoding, using the retrieved rule information, signals transmitted by the base station using the predetermined coding rules.

According to a fifth aspect of the invention there is provided a radio telecommunications system comprising:

at least one base station;

30 at least one mobile station;

the at least one base station including means for transmitting signals to and means for receiving signals from the at least one mobile station;

5 the at least one mobile station including means for receiving signals from and means for transmitting signals to the at least one base station;

the mobile station including means for storing rule information relating to predetermined coding rules;

10 the mobile station also including means for retrieving said rule information; and

the mobile station further including means for encoding, using the retrieved rule information, signals to be transmitted to the base station using the predetermined coding rules.

15 According to a sixth aspect of the invention there is provided a radio telecommunications system comprising:

at least one base station;

a plurality of mobile stations;

20 the at least one base station including means for transmitting signals to and means for receiving signals from each mobile station;

each mobile station including means for receiving signals from and means for transmitting signals to the at least one base station;

each mobile station including means for storing rule information relating to predetermined coding rules;

25 each mobile station also including means for retrieving said rule information; and

each mobile station further including means for encoding or decoding, using the retrieved rule information, signals to be transmitted to or signals received from a second mobile station within the radio telecommunications system, which signals use the predetermined coding rules.

30

According to a seventh aspect of the invention there is provided a method of decoding signals sent by a radio telecommunications system, said system comprising at least one base station and at least one mobile station, comprising:

- 5 storing, in the mobile station, rule information relating to predetermined coding rules;
 retrieving said rule information;
 decoding, using the retrieved rule information, signals received from the radio telecommunications system .

10

According to a eighth aspect of the invention there is provided a method of encoding signals sent to a radio telecommunications system, said system comprising at least one base station and at least one mobile station, comprising:

- 15 storing, in the mobile station, rule information relating to predetermined coding rules;
 retrieving said rule information;
 encoding, using the retrieved rule information, signals to be transmitted to the radio telecommunications system .

20

According to a ninth aspect of the invention there is provided a method of encoding or decoding signals sent from a first mobile station to a second mobile station within a radio telecommunications system , comprising:

- storing, in each mobile station, rule information relating to
25 predetermined coding rules;
 retrieving said rule information;
 encoding or decoding, using the retrieved rule information, signals to be transmitted to or signals received from the second mobile station, which signals use the predetermined coding rules.

30

According to a tenth aspect of the invention there is provided a radio telecommunications system for broadcasting encoded broadcast information over a coverage area, comprising:

at least one mobile station;

5 the at least one base station including means for transmitting, over the coverage area, generic broadcast information in an unencoded format;

the at least one mobile station including means for receiving said generic broadcast information at the least one base station;

10 the mobile station including means for establishing a connection between the mobile station and the base station, using the generic broadcast information;

the base station including means for transmitting, over the connection to the mobile station, rule information relating to predetermined coding rules;

15 the mobile station also including means for storing rule information;

the mobile station further including means for retrieving said rule information;

20 the base station also including means for transmitting, over the coverage area, non-generic broadcast information encoded using the predetermined coding rules; and

wherein said mobile station further includes means for decoding, using the retrieved rule information, the non-generic broadcast information transmitted by the base station.

25

According to a eleventh aspect of the invention there is provided a method of broadcasting encoded broadcast information over a coverage area in a radio telecommunications system, said system comprising at least one base station and at least one mobile station, comprising:

30

transmitting generic broadcast information in an unencoded format over the coverage area;

receiving said generic broadcast information at said mobile station;

said mobile station using the generic broadcast information to establish a connection between the mobile station and the base station;

5 transmitting, over the connection and from the base station to the mobile station, rule information relating to predetermined coding rules;

transmitting, from the base station, non-generic broadcast information encoded using the predetermined coding rules; and

10 said mobile station using said rule information to decode said non-generic broadcast information.

According to a twelfth aspect of the invention there is provided a method of programming, by a radio telecommunications system, a mobile station over a connection, said system comprising at least one base station, comprising:

15 establishing a connection between the mobile station and the at least one base station;

the base station transmitting, over the connection, rule information relating to predetermined coding rules;

programming the mobile station with said rule information;

20 retrieving said rule information;

the mobile station encoding or decoding, using the retrieved rule information, signals to be transmitted to or received from the radio telecommunications system.

25 According to a thirteenth aspect of the invention there is provided a method of programming, by a radio telecommunications system, a mobile station over a connection, said system comprising at least one base station and at least one other mobile station, comprising:

30 establishing a connection between the mobile station and the at least one base station;

the base station transmitting, over the connection, rule information relating to predetermined coding rules;

programming the mobile station with said rule information;
retrieving said rule information;
the mobile station encoding or decoding, using the retrieved
rule information, signals to be transmitted to or received from the at least one
5 other mobile station.

According to another aspect of the invention there is provided a
radio telecommunications system comprising:

at least one base station;
10 at least one mobile station;
the at least one base station including means for transmitting
signals to and means for receiving signals from the at least one mobile
station;
the at least one mobile station including means for receiving
15 signals from and means for transmitting signals to the at least one base
station;
the base station also including means for transmitting, to the
mobile station, rule information relating to predetermined coding rules;
the mobile station also including means for storing and means
20 for retrieving said rule information; and
the mobile station further including means for decoding, using
the retrieved rule information, signals transmitted by the base station using
the predetermined coding rules.

25 According to yet another aspect of the invention there is
provided a radio telecommunications system comprising:

at least one base station;
at least one mobile station;
the at least one base station including means for transmitting
30 signals to and means for receiving signals from the at least one mobile
station;

the at least one mobile station including means for receiving signals from and means for transmitting signals to the at least one base station;

the base station also including means for transmitting, to the
5 mobile station, rule information relating to predetermined coding rules;

the mobile station also including means for storing and means for retrieving said rule information; and

the mobile station further including means for encoding, using the retrieved rule information, signals to be transmitted to the base station
10 using the predetermined coding rules.

The invention provides methods and apparatus to enable the mobile station to encode and/or decode messages, for example messages broadcast by the base station on a broadcast channel. The encoding and decoding is based
15 on a set of rules downloaded to the mobile station into an area of application space or storage dedicated to this function. In the following description, both the application space and rule information loaded into the application space are referred to as the "code-book".

20 The rules relating to the encoding and decoding information may be downloaded during registration with the radio telecommunications system or during another type of communication or connection with the radio telecommunications system. The rule information may be down-loaded to the storing means over broadcast channel, or another control channel or
25 alternatively over a dedicated communications channel. The rule information may also be down-loaded to the storing means during a dedicated communication period separate from the communication required to register the mobile station with the radio telecommunications system. Alternatively, the rules may be pre-loaded into the mobile station, for example when the
30 mobile station is configured for operation on a radio telecommunications system by a particular operator.

The rule information may be updated as the mobile moves around the radio telecommunications system (or PLMN, public land-mobile network) and enters a new area of the radio telecommunications system, for example as the mobile moves between registration areas, or even cells within the network. The rule information may also be updated during the course of a dedicated communication between the mobile station and its serving base station, for example in order to facilitate the change from a GSM call to a W-CDMA UMTS call) or vice versa, or as the functionality of the radio telecommunications system is dynamically updated, for example during peak or off-peak hours.

The rule information enables the mobile station to decode, amongst other signals, broadcast information from the radio telecommunications system; the broadcast information may be partly encoded in accordance with the predetermined decoding rules, and partly in unencoded format or coded using the standard schemes supported by existing communications protocols. The radio telecommunications system may be a digital radio telecommunications system.

The summary of the invention does not necessarily disclose all the features essential for defining the invention; the invention may reside in a sub-combination of the disclosed features.

One advantage of the invention is that it provides a mechanism by which broadcast information may be compressed and thereby broadcast capacity can be increased.

Another advantage of the invention is that it allows the broadcast information to be tailored to the specific operation of a given radio telecommunications system and thereby minimises the overhead caused by broadcast messages needed to fulfil generic needs of the protocol employed by the system.

Yet another advantage of the inventions is that it alleviates the problems of prior art cellular communication systems, and to optimises UMTS systems for future deployment.

- 5 Yet another advantage of the invention is that it alleviates the problems of prior art cellular communication systems, and to optimises UMTS systems for future deployment.

Brief description of the drawings

10

Embodiments of the invention are described below, by way of example only, and with reference to the following figures, in which:

Figure 1 illustrates the general scheme of a personal mobile radio system;

15

Figure 2 illustrates in outline a mobile station according to the invention;

Figure 3 illustrates an example of signals transmitted between a base station and a mobile station to download rule information according to one embodiment of the invention;

20

Figure 4 illustrates graphically a simplified example of a code-book and BCCH message according to the invention.

Detailed description of the preferred embodiments

- 25 The following description is of preferred embodiments only without limitation to the combination of features necessary for putting the invention into effect.

Figure 1 illustrates the general scheme of a PLMN cellular mobile telecommunications system 10. Mobile stations 2, 4 and 6 of figure 1 can
30 communicate with a base station 8. Mobile stations 2, 4 and 6 could equally well be mounted in vehicles. Each of the mobile stations shown in figure 1 can communicate via base station 8 with one or more other mobile stations.

Alternatively, the mobile devices may communicate with other users not part of the PLMN, via other public telecommunications networks connected to the cellular telecommunications system. If mobile stations 2, 4 and 6 are capable of direct mode operation, then they may communicate directly with one another or with other mobile devices, without the communication link passing through base station 8.

Portable mobile radios and their base stations comprise analogous arrangements to those shown in figure 1.

10

As described above, Figure 1 illustrates the general scheme of a cellular mobile telecommunication system 10, called hereafter the mobile telecommunications network or PLMN.

15 Immediately after being switched on or recovering coverage (i.e. upon entering an area of coverage from an area of no coverage), the mobile station searches for a mobile telecommunications network. The mobile station only needs to receive broadcast information containing the identity of the mobile telecommunications network and information regarding initial
20 access to the mobile telecommunications network, for example in order to register on the network.

Imagine that mobile station 2 enters the scenario of figure 1, which in this embodiment represents a cellular mobile telecommunications system and
25 searches for the mobile telecommunications network. Once broadcast information, transmitted by the base station 8, is received by the mobile station. The mobile station requests a connection to the base station, which when granted allows the mobile station to register with the mobile telecommunications network, e.g. using the GSM attach procedure or
30 registration procedure. During the connection established for the registration procedure, or any other initial access by the mobile station, the network transmits, via the down-link established between the base station and the

mobile station, rule information in the form of a code-book to the mobile station. This code-book is stored in a separate area of the mobile station and is illustrated in more detail in figure 2.

5 The mobile station comprises a transmitter 22 and a receiver 28 coupled via a switch 24 to antenna 26. The signals transmitted by the mobile station are generated by the mobile station controller (or processor) 20. Likewise, signals 29 received at the antenna 26 are also processed by the controller. The controller is also connected to a microphone 34, a data terminal 36, a
10 speaker 40 via audio processor 38, display 42 and a keypad 44. Also connected to the controller is a ROM device 32 for storing fixed, essential information used by the controller in communicating with the network, such as the mobile station identification codes etc. Also connected to the controller is a code-book store 46, for example an area of RAM, flash RAM
15 or NV RAM. The controller determines whether the information received from the network, via the base station, is rule information, representative of predetermined coding rules, which should be stored in the code book. Once stored in the code-book store, the rule information can be retrieved and used by the controller to decode the data, or information, contained in signals
20 received at the mobile station antenna. Likewise, the rule information can be used by the controller to encode data to be transmitted in signals transmitted by the mobile station antenna.

25 The rule information may be updated, for example when the mobile station moves between registration areas, or when the functionality of the network system changes.

Thus the rule information stored in the code book enables data in signals transmitted to and from the mobile station to be encoded according to
30 predetermined coding rules. Since the rule information is sent to the mobile station during a connection with the network, the type of coding rules employed may thus be flexible and changed dynamically.

The code-book technique can be extended to be used to "compress" point-to point signalling as well, if the rule information supplied includes a set of encoding rules. Either a general code-book (containing both decoding rules and encoding rules) may be sent, for example at registration, or a dedicated
5 code-book (containing encoding rules to be used for the connection) is sent in the early phase of an established connection.

The code-book of the invention is especially useful for allowing encoding of
10 Associated control channels (ACCH). These channels may be transmitted in parallel with the user information transfer or are realised by frame stealing within the user information transfer. In both cases, the bandwidth is limited.

It will thus now be apparent to one skilled in the art that the code book may
15 be employed in a number of different situations, some of which are described in more detail below.

In order to obtain initial access to a network, or PLMN, only a limited amount of information is needed. Typically, it is sufficient to check if access is
20 allowable and the communication resource is likely to provide a usable signalling link. This limited information is referred in the following description as the "generic broadcast information".

In a first example, the rule information is transmitted by the network and
25 stored in the code-book store may contain, amongst other things, the decoding rules for further broadcast information which is not a part of the generic broadcast information. This allows compression of the broadcast information to the minimum required for the operation of the given network. The code-book can be updated during any later access to the network;
30 however to minimise the need for updating, the code-book may maintain constant or identical decoding rules across a registration area or a full PLMN. If the decoding rules are kept constant within a registration area, the use of

the code-book will not generate the need for additional access to the network, as the mobile would normally have to access the network at change of registration area.

- 5 Once downloaded from the network, the mobile station utilises the received code-book to decode any further broadcast information. The broadcast information can, as described above, be considered to consist of two parts - the "generic" broadcast information and the "non-generic" broadcast information. In addition this latter non-generic information can again be split
10 into two parts, one part may be transmitted in such a manner as not to require the code-book to decode the information, although the information may never-the-less be encoded using encoding schemes or processes supported by the protocol running on the network. The other part of the information may require the code-book to decode or understand the
15 information.

Registration and downloading of the rule information, or code-book, is illustrated in figure 3, using by way of example the GSM location update procedure. On receiving the BCCH signal the mobile requests a channel
20 with request 50. The network, via the base station, responds by assigning a channel with channel assignment 52, and begins transmitting the code book rule information, in the code-book download 54. The mobile accepts the code book information with code-book accept 56 and the rest of the signals (60 to 72) are exchanged in the known manner. However, these signals may
25 be encoded using the rule information, as described above, thereby enabling the messages exchanged (such as location updating 60 & 62, cipher mode 64 & 66, authentication 68 & 70 and TMSI allocation 72) to be compressed.

In a second example, a GSM network needs to broadcast information about
30 neighbouring cells in a UMTS network (or UMTS portion of the same PLMN). In a UMTS network the centre frequency of the W-CDMA carrier is placed on a 200 kHz raster and potentially uses variable duplex spacing. This will, if

generic encoding rules are used, require that for each potential neighbour the broadcast information is capable of indicating any of approximately 300 potential carrier positions for up-link communication and a similar number for down-link communications. However, in practice an operator will only have very few carriers, e.g., an operator with an allocation of 2 x 20 MHz will only have 4–5 potential carrier up-link and down-link positions. If the code-book of the invention is used, then the code-book transmitted to the mobile station at, e.g. registration, can be used by the mobile to determine how octet N of message Y should be translated or decoded.

One example of such neighbour list encoding is illustrated the representation of the code books and messages of figure 4. The rule information illustrated graphically by the look-up table 80 is transmitted by the GSM network to be stored in the code-book and defines, amongst other things, the definitions of a number of UMTS WCDMA carriers (shown in figure 4 as carriers A to H). These definitions may include either the up-link frequency or the down-link frequency or duplex spacing. The definitions may also include the mode, such as frequency domain duplexing (FDD), time domain duplexing (TDD) etc., the relative timing and/or the code used (e.g. GMSK, codec rate).

Octet N of the message 82 illustrated represents a bit map, which in turn indicates the presence of carriers available as neighbours. The example octet, shown as 84, when decoded with the rule information from the code-book, indicates that carriers A,C,E,F and H are neighbour carriers.

The octet might also list the absolute frequency or absolute radio frequency number corresponding to each bit. In the above example any available UMTS neighbour frequency could be encoded in one octet on the broadcast channel, with full flexibility in the spectrum allocation. The bit mapping (that is, the look-up table for each bits which makes up the octet) to the correct absolute frequency is provided through the rule information stored in the

code-book, which may, as described above, be provided to the mobile station on a dedicated channel at some other time during the interaction.

5 A similar technique can be applied to indicate which neighbour cells to measure, for example when the mobile station is in dedicated communication with the base station, such as when initiating or receiving a call. This may be used in, for example, mobile assisted handover.

10 The use of the invention in relation to dedicated connections can be split into two main categories. In these examples of the invention, the code-book is downloaded to the mobile station prior to the establishment of the dedicated connection, e.g., at registration. The code-book specifies the encoding and decoding of messages or part of messages exchanged between the network and the mobile station during the dedicated connections.

15 A first dedicated connections example of the invention may be applied to a network (PLMN) consisting of both a GSM radio access portion and a UMTS radio access portion. The code-book is downloaded to the mobile station, and specifies, in particular, that when messages contains some explicit GSM
20 ARFCNs (Absolute Radio Frequency numbers), these should be interpreted as given UMTS carriers (defined by mode (TDD/FDD), centre-frequency, duplex-spacing (for FDD) and possibly also bandwidth and chiprate). This use of the code-book thus allows reuse of GSM signalling, e.g., to command mobile stations in connected mode to monitor UMTS carriers for neighbour
25 measurement reporting. In addition, the code-book can be used to compress the signalling channels and thereby decrease the overhead required for signalling. This process may be adapted and applied to the broadcast examples discussed previously.

30 In a second dedicated connections example of the invention, the code-book is downloaded and/or updated during an established dedicated connection. This can be implemented in conjunction with the first dedicated

communication example described above, to update the code-book stored in the mobile station, e.g. in cases where the network is being reconfigured, or independently. Alternatively, this second dedicated communication example may be used for time critical messages such as, e.g., assignment and
5 handover messages, where too large a message size would cause segmentation and thereby introduce a transmission delay. Such messages will typically be defined to cope with all types of configuration and modes of operation. By using a code-book, specified and downloaded to the mobile station, the time critical messages may be kept small because bits are only
10 assigned to signal information relevant for the actual configuration and mode of operation in the given cell, registration area, or PLMN. Additionally, and as above, the code-book can be used for compression of the signalling channels and thereby decrease the overhead required for signalling.

15 The code-book may also be used to specify error correcting codes used, e.g., on the physical layer or upper layers. For example, a code-book which specifies types of error correcting codes (Convolutional, Reed-Solomon, Turbo-code etc., the rate (e.g., 1/2, 1/3, 2/3 etc), the generator polynomials, and tailbit), may be downloaded to the mobile. This example provides the
20 means for flexible allocation of protection level and may also be used to define broadcast channels.

It will thus be apparent to one skilled in the art that the invention has a number of different applications within the scope of the claims and has a
25 number of advantages. For example, the invention provides for a dynamic and flexible approach to down-loading or pre-loading of the rule information, and to the use of encoded signals sent either from a mobile station or a base station. The invention may also find application in capsule type cellular radio systems.

Claims

1. A mobile station for communicating with a radio telecommunications system, the mobile station comprising:

5 means for communicating with the radio telecommunications system ;

means for storing rule information relating to predetermined coding rules;

means for retrieving said rule information;

10 means for decoding, using the retrieved rule information, signals received from the radio telecommunications system .

2. A mobile station for communication over a telecommunications system, the mobile station comprising:

15 means for communicating with the radio telecommunications system ;

means for storing and retrieving rule information relating to predetermined coding rules;

20 means for encoding, using the retrieved rule information, signals to be transmitted to the radio telecommunications system .

3. A first mobile station for communicating with second mobile station in a telecommunications system, the first mobile station comprising:

25 means for storing rule information relating to predetermined coding rules;

means for communicating with the second mobile station;

means for retrieving said rule information;

30 means for encoding or decoding, using the retrieved rule information, signals to be transmitted to or signals received from the second mobile station, which signals use the predetermined coding rules.

4. A mobile station in accordance with claim 1, 2 or 3, wherein the rule information is down-loaded to the storing means during registration of the mobile station with the telecommunications system.

5. A mobile station in accordance with claim 1, 2 or 3, wherein the rule information is down-loaded to the storing means over a dedicated communications channel.

6. A mobile station in accordance with claim 1, 2 or 3, wherein the rule information is down-loaded to the storing means during a dedicated communication period separate from the communication required to register the mobile station with the telecommunications system.

7. A mobile station in accordance with claim 1, 2 or 3, wherein the rule information is down-loaded to the storing means as pre-loaded information, prior to registration of the mobile station with the telecommunications system.

8. A mobile station in accordance with any previous claim, wherein the rule information is up-dated each time that the mobile station enters a new area of the radio telecommunications system .

9. A mobile station in accordance with any previous claim, wherein the rule information is up-dated each time that the mobile station enters a new registration area of the radio telecommunications system .

10. A mobile station in accordance with any previous claim, wherein the rule information is up-dated each time that the mobile station enters a new cell of the radio telecommunications system .

11. A mobile station in accordance with any previous claim in so far as dependent upon claim 1, wherein the rule information enables the mobile

station to decode broadcast information from the telecommunications system.

12. A mobile station in accordance with any previous claim in so far
5 as dependent upon claim 1, wherein the rule information enables mobile station to decode broadcast information from the telecommunications system, the broadcast information being partly encoded in accordance with the predetermined decoding rules, and partly in unencoded format.

10 13. A mobile station in accordance with any previous claim, where the radio telecommunications system is a digital radio telecommunications system .

14. A radio telecommunications system comprising:
15 at least one base station;
at least one mobile station;
the at least one base station including means for transmitting signals to and means for receiving signals from the at least one mobile station;
20 the at least one mobile station including means for receiving signals from and means for transmitting signals to the at least one base station;
the mobile station including means for storing rule information relating to predetermined coding rules;
25 the mobile station also including means for retrieving said rule information; and
the mobile station further including means for decoding, using the retrieved rule information, signals transmitted by the base station using the predetermined coding rules.

30

15. A radio telecommunications system comprising:
at least one base station;

at least one mobile station;

the at least one base station including means for transmitting signals to and means for receiving signals from the at least one mobile station;

5 the at least one mobile station including means for receiving signals from and means for transmitting signals to the at least one base station;

the mobile station including means for storing rule information relating to predetermined coding rules;

10 the mobile station also including means for retrieving said rule information; and

the mobile station further including means for encoding, using the retrieved rule information, signals to be transmitted to the base station using the predetermined coding rules.

15

16. A radio telecommunications system comprising:

at least one base station;

a plurality of mobile stations;

20 the at least one base station including means for transmitting signals to and means for receiving signals from each mobile station;

each mobile station including means for receiving signals from and means for transmitting signals to the at least one base station;

each mobile station including means for storing rule information relating to predetermined coding rules;

25 each mobile station also including means for retrieving said rule information; and

each mobile station further including means for encoding or decoding, using the retrieved rule information, signals to be transmitted to or signals received from a second mobile station within the radio telecommunications system, which signals use the predetermined coding rules.

30

17. A radio telecommunications system in accordance with claim 14, 15 or 16, wherein the rule information is down-loaded to the storing means of the mobile station during registration of the mobile station with the telecommunications system.

5

18. A radio telecommunications system in accordance with claim 14, 15 or 16, wherein the rule information is down-loaded to the storing of the mobile station means over a dedicated communications channel.

10 19. A radio telecommunications system in accordance with claim 14, 15 or 16, wherein the rule information is down-loaded to the storing of the mobile station means during a dedicated communication period separate from the communication required to register the mobile station with the telecommunications system.

15

20. A radio telecommunications system in accordance with claim 14, 15 or 16, wherein the rule information is down-loaded to the storing of the mobile station means as pre-loaded information, prior to registration of the mobile station with the telecommunications system.

20

21. A radio telecommunications system in accordance with any of claims 14 to 20, wherein the rule information is up-dated each time that the mobile station enters a new area of the radio telecommunications system .

25 22. A radio telecommunications system in accordance with any of claims 14 to 21, wherein the rule information is up-dated each time that the mobile station enters a new registration area of the radio telecommunications system .

30 23. A radio telecommunications system in accordance with any of claims 14 to 22, wherein the rule information is up-dated each time that the mobile station enters a new cell of the radio telecommunications system .

24. A radio telecommunications system in accordance with any of claims 14 to 23 in so far as dependent upon claim 14, wherein the rule information enables the mobile station to decode broadcast information from the telecommunications system.

25. A radio telecommunications system in accordance with any of claims 14 to 24 in so far as dependent upon claim 14, wherein the rule information enables mobile station to decode broadcast information from the telecommunications system, the broadcast information being partly encoded in accordance with the predetermined decoding rules, and partly in unencoded format.

26. A radio telecommunications system in accordance with any of claims 14 to 25, where the radio telecommunications system is a digital radio telecommunications system .

27. A method of decoding signals sent by a radio telecommunications system , said system comprising at least one base station and at least one mobile station, comprising:

storing, in the mobile station, rule information relating to predetermined coding rules;
retrieving said rule information;
decoding, using the retrieved rule information, signals received from the radio telecommunications system .

28. A method of encoding signals sent to a radio telecommunications system, said system comprising at least one base station and at least one mobile station, comprising:

storing, in the mobile station, rule information relating to predetermined coding rules;
retrieving said rule information;

encoding, using the retrieved rule information, signals to be transmitted to the radio telecommunications system .

29. A method of encoding or decoding signals sent from a first
5 mobile station to a second mobile station within a radio telecommunications system , comprising:

storing, in each mobile station, rule information relating to predetermined coding rules;

retrieving said rule information;

10 encoding or decoding, using the retrieved rule information, signals to be transmitted to or signals received from the second mobile station, which signals use the predetermined coding rules.

30. A method in accordance with claim 27, 28 or 29, comprising
15 down-loading the rule information to the storing means during registration of the mobile station with the telecommunications system.

31. A method in accordance with claim 27, 28 or 29, comprising
20 down-loading the rule information to the storing means over a dedicated communications channel.

32. A method in accordance with claim 27, 28 or 29, comprising
down-loading the rule information to the storing means during a dedicated
communication period separate from the communication required to register
25 the mobile station with the telecommunications system.

33. A method in accordance with claim 27, 28 or 29, comprising
down-loading the rule information to the storing means as pre-loaded
information, prior to registration of the mobile station with the
30 telecommunications system.

34. A method in accordance with any of claims 27 to 33, comprising up-dating the rule information each time that the mobile station enters a new area of the radio telecommunications system .

5 35. A method in accordance with any of claims 27 to 34, comprising up-dating the rule information each time that the mobile station enters a new registration area of the radio telecommunications system .

10 36. A method in accordance with any of claims 27 to 35, comprising up-dating the rule information each time that the mobile station enters a new cell of the radio telecommunications system .

15 37. A method in accordance with any of claims 27 to 36 in so far as dependent upon claim 26 comprising enabling the mobile station to decode, using the rule information, broadcast information from the telecommunications system.

20 38. A method in accordance with any of claims 27 to 37 in so far as dependent upon claim 26, comprising enabling the mobile station to decode, using the rule information, broadcast information from the telecommunications system, the broadcast information being partly encoded in accordance with the predetermined decoding rules, and partly in unencoded format.

25 39. A method in accordance with any of claims 28 to 38, where the radio telecommunications system is a digital radio telecommunications system .

30 40. A radio telecommunications system for broadcasting encoded broadcast information over a coverage area, comprising:
at least one mobile station;

the at least one base station including means for transmitting, over the coverage area, generic broadcast information in an unencoded format;

the at least one mobile station including means for receiving
5 said generic broadcast information at the least one base station;

the mobile station including means for establishing a connection between the mobile station and the base station, using the generic broadcast information;

the base station including means for transmitting, over the
10 connection to the mobile station, rule information relating to predetermined coding rules;

the mobile station also including means for storing rule information;

the mobile station further including means for retrieving said
15 rule information;

the base station also including means for transmitting, over the coverage area, non-generic broadcast information encoded using the predetermined coding rules; and

wherein said mobile station further includes means for
20 decoding, using the retrieved rule information, the non-generic broadcast information transmitted by the base station.

41. A radio telecommunications system in accordance with claim 40, where, in the alternative to the base station including means for
25 transmitting, over the connection to the mobile station, rule information relating to predetermined coding rules, the rule information is down-loaded to the storing means of the mobile station means as pre-loaded information.

42. A radio telecommunications system in accordance with claim
30 40, wherein the rule information is up-dated each time that the mobile station enters a new area of the radio telecommunications system.

43. A radio telecommunications system in accordance with claims 40, wherein the rule information is up-dated each time that the mobile station enters a new registration area of the radio telecommunications system .

5 44. A radio telecommunications system in accordance with claims 40, wherein the rule information is up-dated each time that the mobile station enters a new cell of the radio telecommunications system .

10 45. A radio telecommunications system in accordance with any of claims 40 to 44, the non-generic broadcast information is in partly encoded in accordance with the predetermined decoding rules, and partly in unencoded format.

15 46. A radio telecommunications system in accordance with any of claims 40 to 45, where the radio telecommunications system is a digital radio telecommunications system .

20 47. A method of broadcasting encoded broadcast information over a coverage area in a radio telecommunications system, said system comprising at least one base station and at least one mobile station, comprising:

transmitting generic broadcast information in an unencoded format over the coverage area;

25 receiving said generic broadcast information at said mobile station;

said mobile station using the generic broadcast information to establish a connection between the mobile station and the base station;

transmitting, over the connection and from the base station to the mobile station, rule information relating to predetermined coding rules;

30 transmitting, from the base station, non-generic broadcast information encoded using the predetermined coding rules; and

said mobile station using said rule information to decode said non-generic broadcast information.

48. A method in accordance with claim 47, comprising, in the
5 alternative to the base station transmitting, over the connection to the mobile station, rule information relating to predetermined coding rules, the rule information is down-loaded to the storing means of the mobile station means as pre-loaded information.

10 49. A method in accordance with claim 47, comprising updating the rule information each time that the mobile station enters a new area of the radio telecommunications system .

15 50. A method in accordance with claims 47, comprising updating the rule information each time that the mobile station enters a new registration area of the radio telecommunications system .

20 51. A method in accordance with claims 47, comprising updating the rule information each time that the mobile station enters a new cell of the radio telecommunications system.

25 52. A method in accordance with any of claims 47 to 51, comprising transmitting the non-generic broadcast information in partly encoded in accordance with the predetermined decoding rules, and partly in unencoded format.

30 53. A method in accordance with any of claims 47 to 52, where the radio telecommunications system is a digital radio telecommunications system .

54. A method of programming, by a radio telecommunications system, a mobile station over a connection, said system comprising at least one base station, comprising:

5 establishing a connection between the mobile station and the at least one base station;

the base station transmitting, over the connection, rule information relating to predetermined coding rules;

programming the mobile station with said rule information;

retrieving said rule information;

10 the mobile station encoding or decoding, using the retrieved rule information, signals to be transmitted to or received from the radio telecommunications system.

55. A method of programming, by a radio telecommunications system, a mobile station over a connection, said system comprising at least one base station and at least one other mobile station, comprising:

15 establishing a connection between the mobile station and the at least one base station;

20 the base station transmitting, over the connection, rule information relating to predetermined coding rules;

programming the mobile station with said rule information;

retrieving said rule information;

25 the mobile station encoding or decoding, using the retrieved rule information, signals to be transmitted to or received from the at least one other mobile station.

56. A method in accordance with claims 54 or 55, comprising updating the rule information each time that the mobile station enters a new area of the radio telecommunications system.

57. A method in accordance with claims 54 or 55, comprising updating the rule information each time that the mobile station enters a new registration area of the radio telecommunications system .

5 58. A method in accordance with claims 54 or 55, comprising updating the rule information each time that the mobile station enters a new cell of the radio telecommunications system .

59. A method in accordance with any of claims 54, or 56 to 58 in so
10 far as dependent upon claim 55, comprising enabling the mobile station to decode, using the rule information, broadcast information from the telecommunications system.

60. A method in accordance with any of claims 54, or 56 to 59 in so
15 far as dependent upon claim 54, comprising enabling the mobile station to decode, using the rule information, broadcast information from the telecommunications system, the broadcast information being partly encoded in accordance with the predetermined decoding rules, and partly in unencoded format.

20

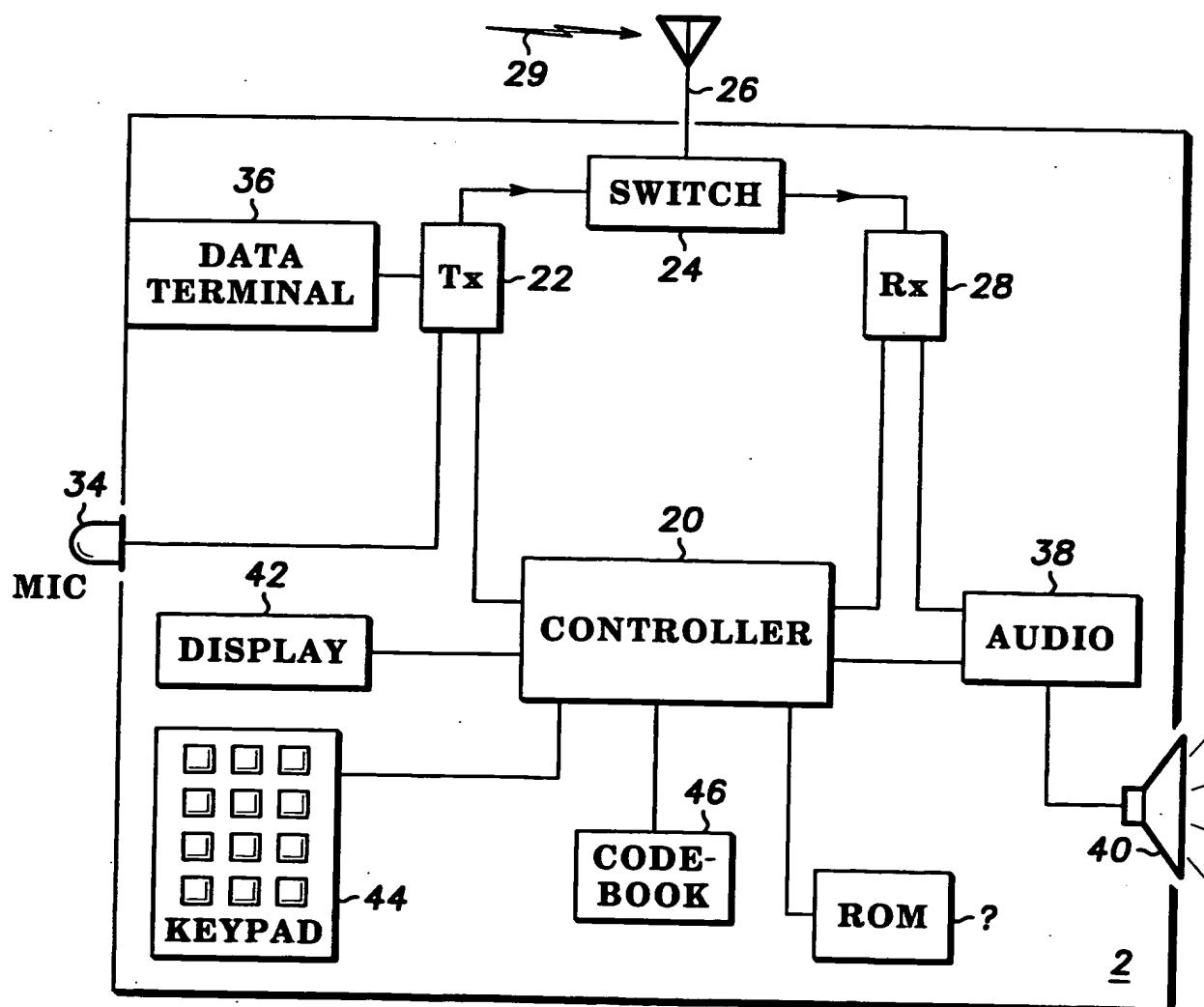
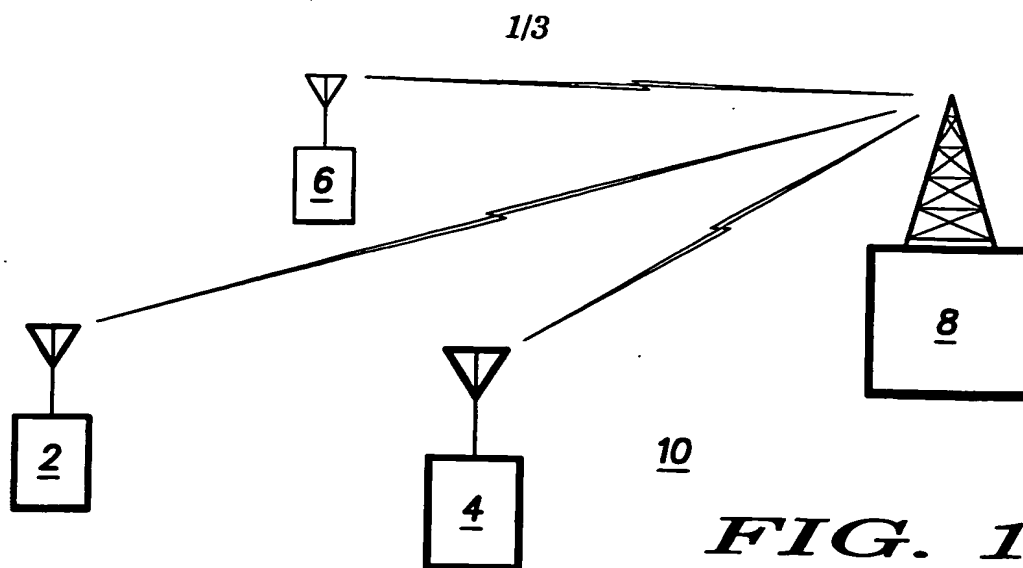
61. A method in accordance with any of claims 54 to 60, where the radio telecommunications system is a digital radio telecommunications system .

25 62. Apparatus substantially as hereinbefore described.

63. A method substantially as hereinbefore described.

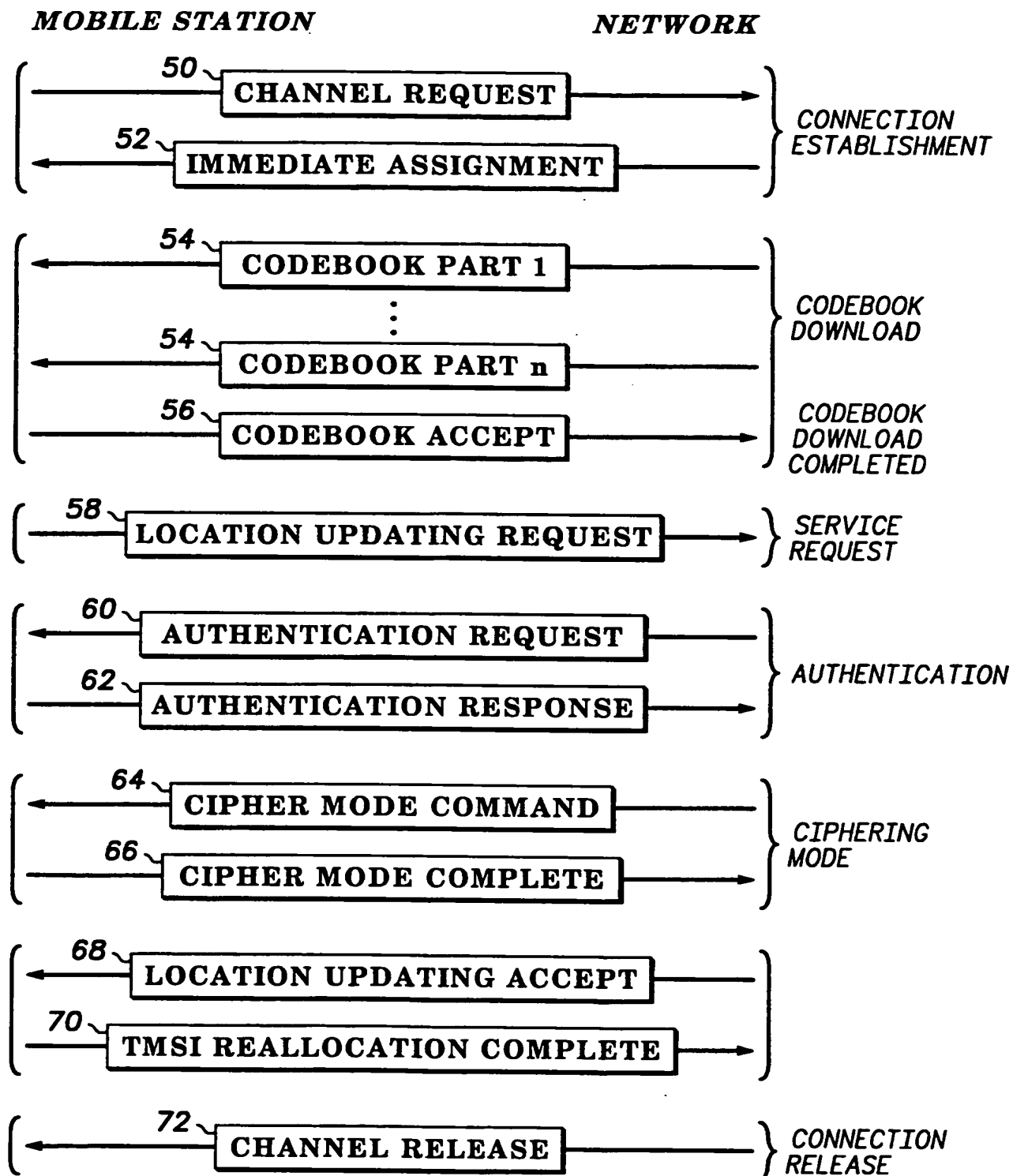
64. Apparatus substantially as hereinbefore described with reference to, or as illustrated by, any of figures 1 to 4.

65. A method substantially as hereinbefore described with
30 reference to, or as illustrated by, any of figures 1 to 4.

**FIG. 2**

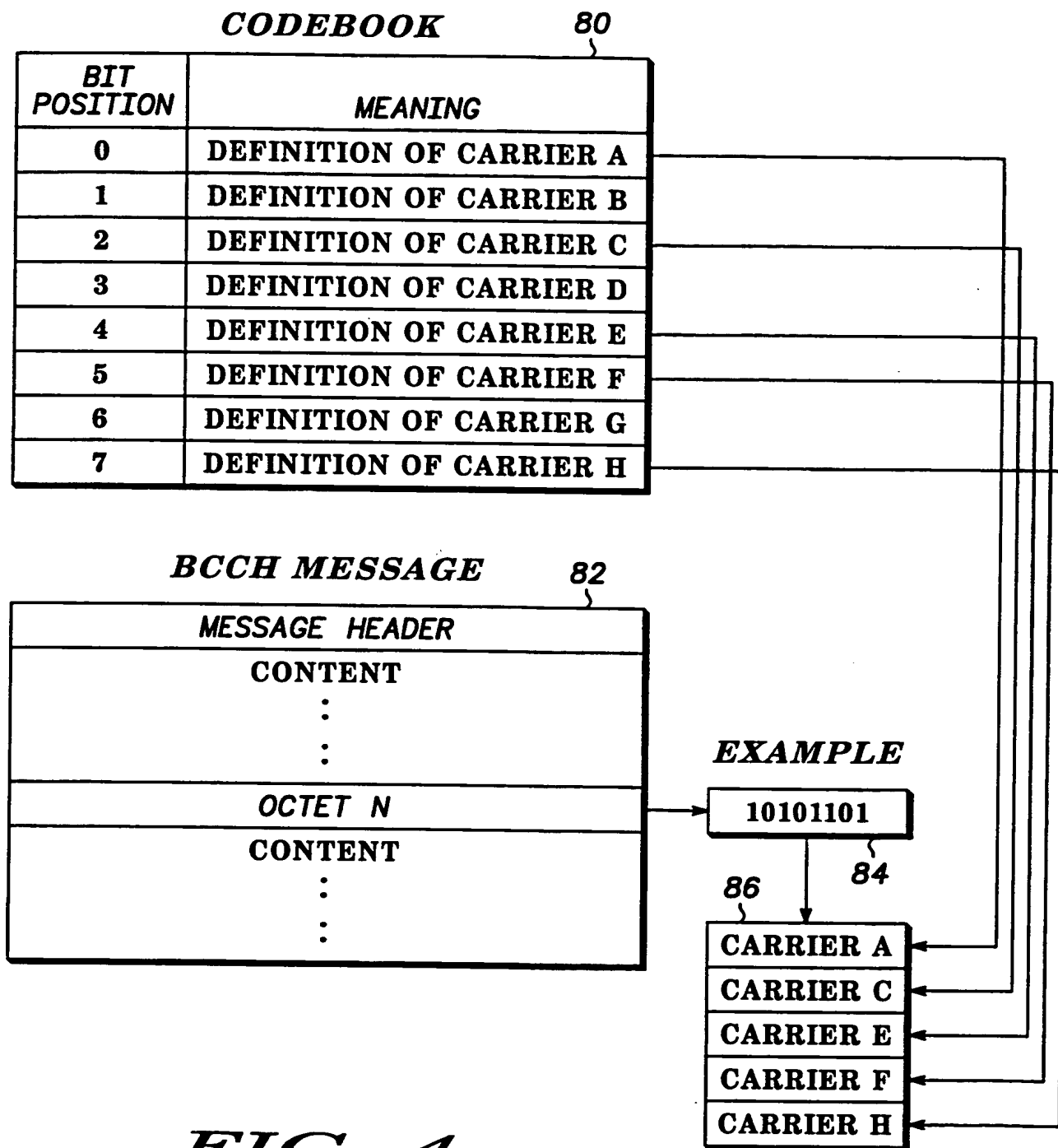
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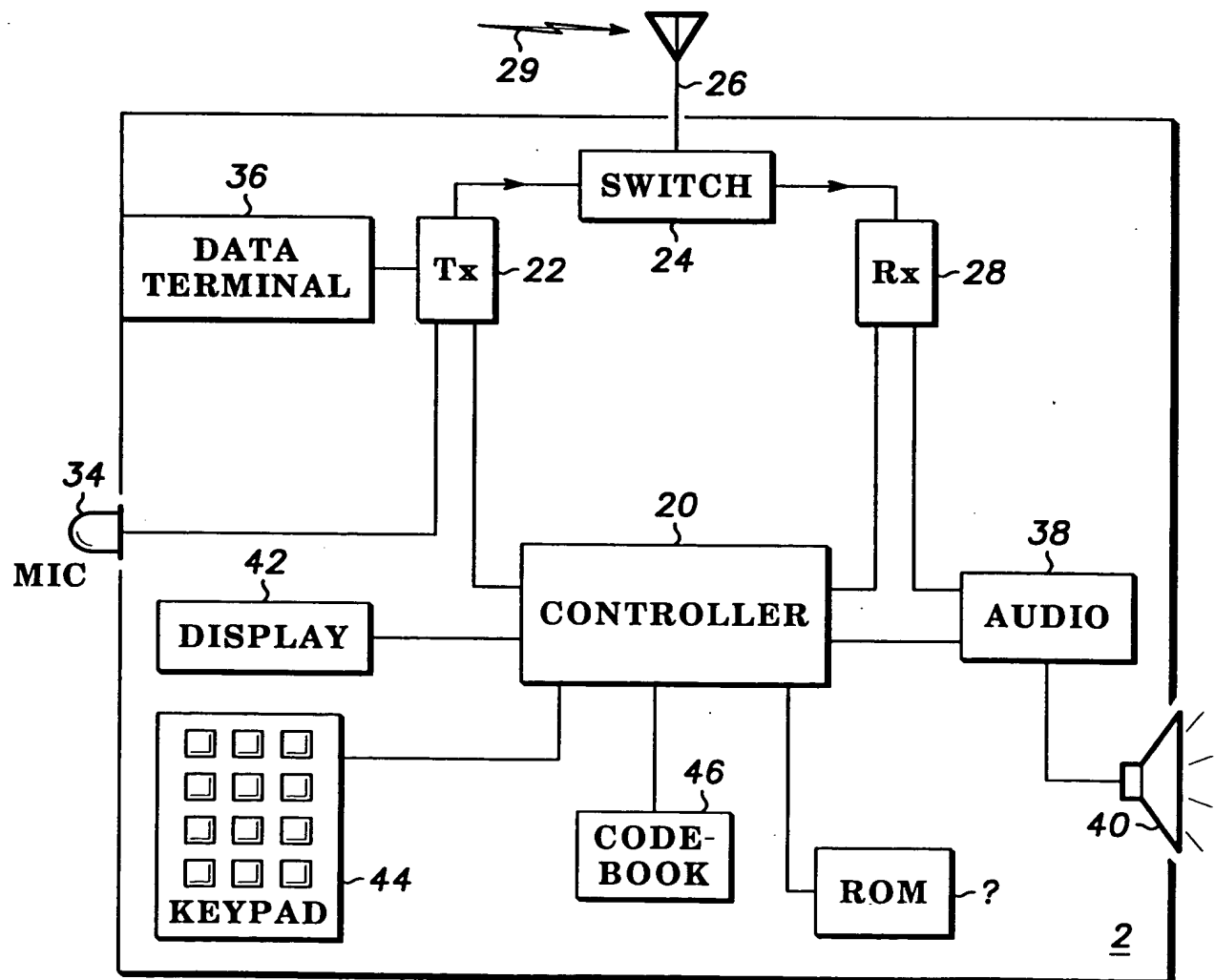
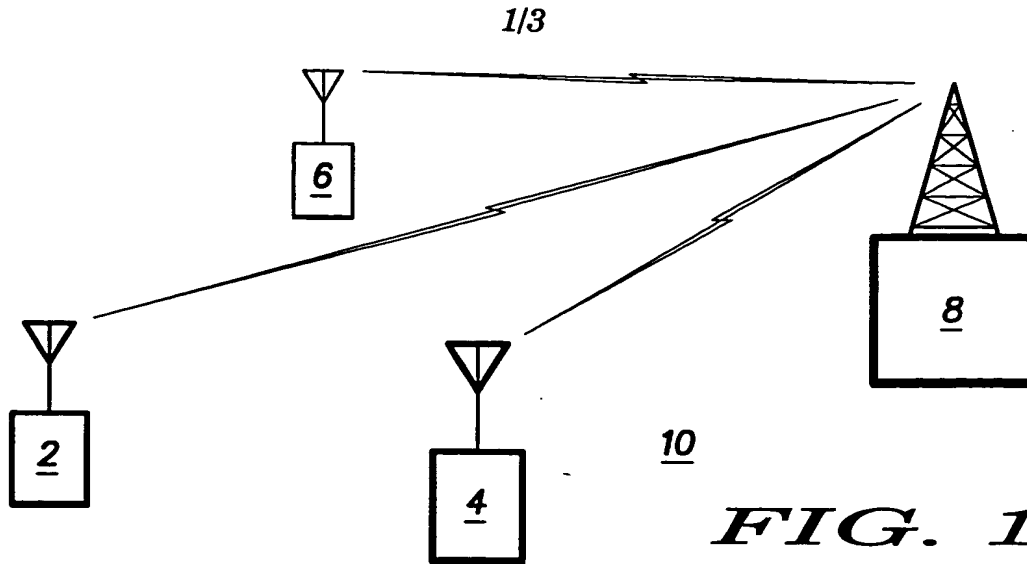


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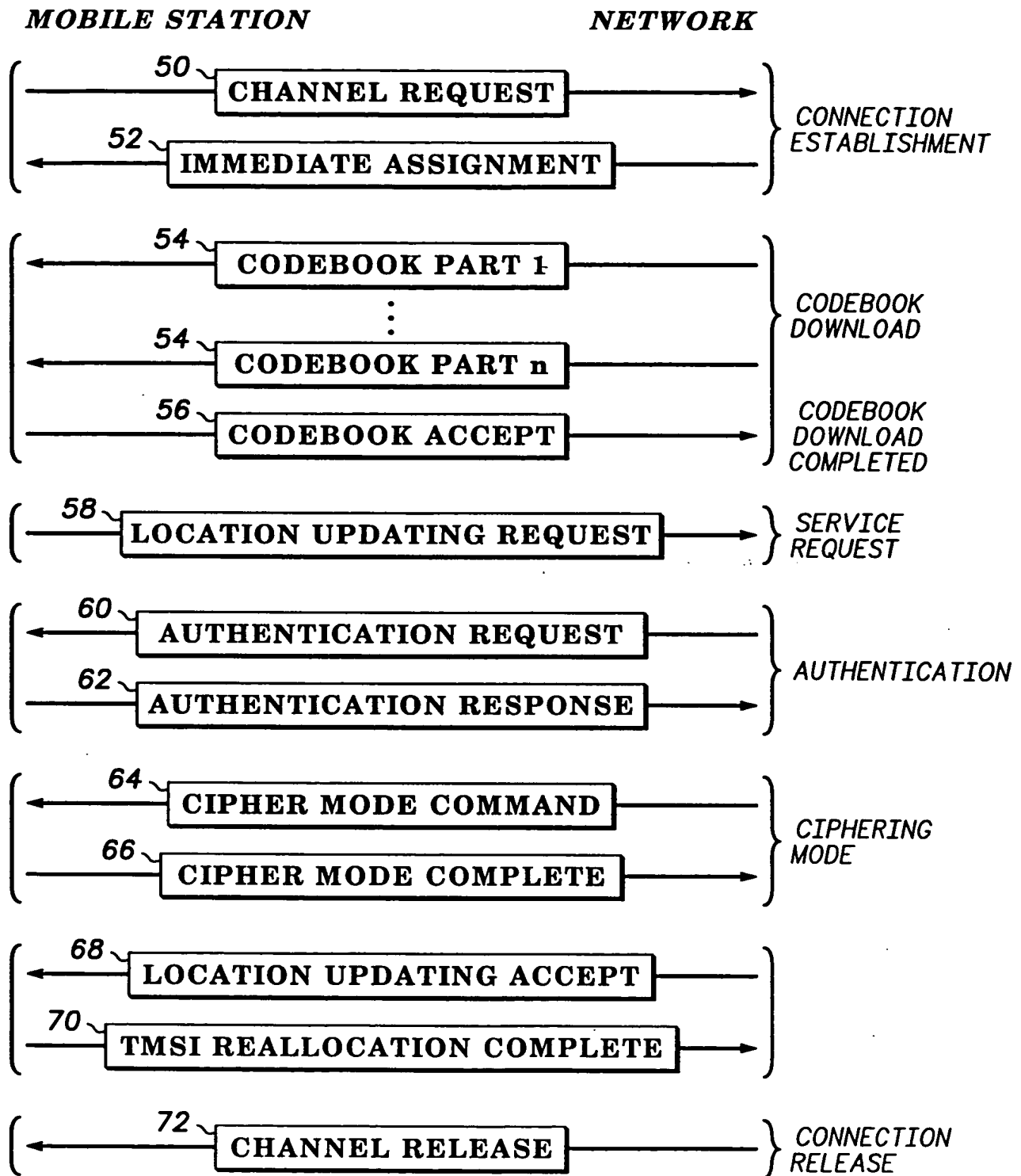
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**FIG. 3**

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<i>BIT POSITION</i>	<i>MEANING</i>
0	DEFINITION OF CARRIER A
1	DEFINITION OF CARRIER B
2	DEFINITION OF CARRIER C
3	DEFINITION OF CARRIER D
4	DEFINITION OF CARRIER E
5	DEFINITION OF CARRIER F
6	DEFINITION OF CARRIER G
7	DEFINITION OF CARRIER H

82

MESSAGE HEADER
CONTENT : :
OCTET N
CONTENT : :

EXAMPLE

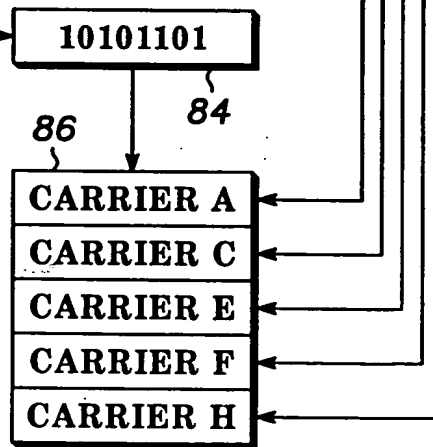


FIG. 4

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PATENT COOPERATION TREATY

From the INTERNATIONAL SEARCHING AUTHORITY

PCT

To:
MOTOROLA INC.
 European Intel. Property Operations
 Attn. MORGAN, Marc
 Midpoint, Alencon Link
 Basingstoke
 Hampshire RG21 7PL
 UNITED KINGDOM

NOTIFICATION OF TRANSMITTAL OF
 THE INTERNATIONAL SEARCH REPORT
 OR THE DECLARATION

(PCT Rule 44.1)
EUROPEAN

06 MAR 2001

**PATENT
 DEPT.**

Date of mailing
 (day/month/year)

01/03/2001

Applicant's or agent's file reference

CE50039P/PCT

FOR FURTHER ACTION

See paragraphs 1 and 4 below

International application No.

PCT/EP 00/ 10199

International filing date
 (day/month/year)

16/10/2000

Applicant

MOTOROLA LIMITED

1. ☒ The applicant is hereby notified that the International Search Report has been established and is transmitted herewith.

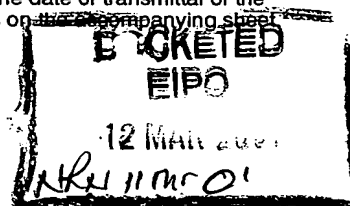
Filing of amendments and statement under Article 19:

The applicant is entitled, if he so wishes, to amend the claims of the International Application (see Rule 46):

When? The time limit for filing such amendments is normally 2 months from the date of transmittal of the International Search Report; however, for more details, see the notes on the accompanying sheet

Where? Directly to the International Bureau of WIPO
 34, chemin des Colombettes
 1211 Geneva 20, Switzerland
 Facsimile No.: (41-22) 740.14.35

For more detailed instructions, see the notes on the accompanying sheet.



2. ☐ The applicant is hereby notified that no International Search Report will be established and that the declaration under Article 17(2)(a) to that effect is transmitted herewith.

3. ☐ With regard to the protest against payment of (an) additional fee(s) under Rule 40.2, the applicant is notified that:

☐ the protest together with the decision thereon has been transmitted to the International Bureau together with the applicant's request to forward the texts of both the protest and the decision thereon to the designated Offices.

☐ no decision has been made yet on the protest; the applicant will be notified as soon as a decision is made.

4. **Further action(s):** The applicant is reminded of the following:

Shortly after **18 months** from the priority date, the international application will be published by the International Bureau. If the applicant wishes to avoid or postpone publication, a notice of withdrawal of the international application, or of the priority claim, must reach the International Bureau as provided in Rules 90bis.1 and 90bis.3, respectively, before the completion of the technical preparations for international publication.

Within **19 months** from the priority date, a demand for international preliminary examination must be filed if the applicant wishes to postpone the entry into the national phase until 30 months from the priority date (in some Offices even later).

Within **20 months** from the priority date, the applicant must perform the prescribed acts for entry into the national phase before all designated Offices which have not been elected in the demand or in a later election within 19 months from the priority date or could not be elected because they are not bound by Chapter II.

Name and mailing address of the International Searching Authority



European Patent Office, P.B. 5818 Patentlaan 2
 NL-2280 HV Rijswijk
 Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,
 Fax: (+31-70) 340-3016

Authorized officer

Stylianos Vasilakis

**REJECTED
 EIPO**

07 MAR 2001

AMN 01Mx01

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NOTES TO FORM PCT/ISA/220

These Notes are intended to give the basic instructions concerning the filing of amendments under article 19. The Notes are based on the requirements of the Patent Cooperation Treaty, the Regulations and the Administrative Instructions under that Treaty. In case of discrepancy between these Notes and those requirements, the latter are applicable. For more detailed information, see also the PCT Applicant's Guide, a publication of WIPO.

In these Notes, "Article", "Rule", and "Section" refer to the provisions of the PCT, the PCT Regulations and the PCT Administrative Instructions respectively.

INSTRUCTIONS CONCERNING AMENDMENTS UNDER ARTICLE 19

The applicant has, after having received the international search report, one opportunity to amend the claims of the international application. It should however be emphasized that, since all parts of the international application (claims, description and drawings) may be amended during the international preliminary examination procedure, there is usually no need to file amendments of the claims under Article 19 except where, e.g. the applicant wants the latter to be published for the purposes of provisional protection or has another reason for amending the claims before international publication. Furthermore, it should be emphasized that provisional protection is available in some States only.

What parts of the International application may be amended?

Under Article 19, only the claims may be amended.

During the international phase, the claims may also be amended (or further amended) under Article 34 before the International Preliminary Examining Authority. The description and drawings may only be amended under Article 34 before the International Examining Authority.

Upon entry into the national phase, all parts of the international application may be amended under Article 28 or, where applicable, Article 41.

When?

Within 2 months from the date of transmittal of the international search report or 16 months from the priority date, whichever time limit expires later. It should be noted, however, that the amendments will be considered as having been received on time if they are received by the International Bureau after the expiration of the applicable time limit but before the completion of the technical preparations for international publication (Rule 46.1).

Where not to file the amendments?

The amendments may only be filed with the International Bureau and not with the receiving Office or the International Searching Authority (Rule 46.2).

Where a demand for international preliminary examination has been/is filed, see below.

How?

Either by cancelling one or more entire claims, by adding one or more new claims or by amending the text of one or more of the claims as filed.

A replacement sheet must be submitted for each sheet of the claims which, on account of an amendment or amendments, differs from the sheet originally filed.

All the claims appearing on a replacement sheet must be numbered in Arabic numerals. Where a claim is cancelled, no renumbering of the other claims is required. In all cases where claims are renumbered, they must be renumbered consecutively (Administrative Instructions, Section 205(b)).

The amendments must be made in the language in which the international application is to be published.

What documents must/may accompany the amendments?

Letter (Section 205(b)):

The amendments must be submitted with a letter.

The letter will not be published with the international application and the amended claims. It should not be confused with the "Statement under Article 19(1)" (see below, under "Statement under Article 19(1)").

The letter must be in English or French, at the choice of the applicant. However, if the language of the international application is English, the letter must be in English; if the language of the international application is French, the letter must be in French.

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NOTES TO FORM PCT/ISA/220 (continued)

The letter must indicate the differences between the claims as filed and the claims as amended. It must, in particular, indicate, in connection with each claim appearing in the international application (it being understood that identical indications concerning several claims may be grouped), whether

- (i) the claim is unchanged;
- (ii) the claim is cancelled;
- (iii) the claim is new;
- (iv) the claim replaces one or more claims as filed;
- (v) the claim is the result of the division of a claim as filed.

The following examples illustrate the manner in which amendments must be explained in the accompanying letter:

1. [Where originally there were 48 claims and after amendment of some claims there are 51]:
"Claims 1 to 29, 31, 32, 34, 35, 37 to 48 replaced by amended claims bearing the same numbers; claims 30, 33 and 36 unchanged; new claims 49 to 51 added."
2. [Where originally there were 15 claims and after amendment of all claims there are 11]:
"Claims 1 to 15 replaced by amended claims 1 to 11."
3. [Where originally there were 14 claims and the amendments consist in cancelling some claims and in adding new claims]:
"Claims 1 to 6 and 14 unchanged; claims 7 to 13 cancelled; new claims 15, 16 and 17 added." or
"Claims 7 to 13 cancelled; new claims 15, 16 and 17 added; all other claims unchanged."
4. [Where various kinds of amendments are made]:
"Claims 1-10 unchanged; claims 11 to 13, 18 and 19 cancelled; claims 14, 15 and 16 replaced by amended claim 14; claim 17 subdivided into amended claims 15, 16 and 17; new claims 20 and 21 added."

"Statement under article 19(1)" (Rule 46.4)

The amendments may be accompanied by a statement explaining the amendments and indicating any impact that such amendments might have on the description and the drawings (which cannot be amended under Article 19(1)).

The statement will be published with the international application and the amended claims.

It must be in the language in which the international application is to be published.

It must be brief, not exceeding 500 words if in English or if translated into English.

It should not be confused with and does not replace the letter indicating the differences between the claims as filed and as amended. It must be filed on a separate sheet and must be identified as such by a heading, preferably by using the words "Statement under Article 19(1)."

It may not contain any disparaging comments on the international search report or the relevance of citations contained in that report. Reference to citations, relevant to a given claim, contained in the international search report may be made only in connection with an amendment of that claim.

Consequence if a demand for international preliminary examination has already been filed

If, at the time of filing any amendments under Article 19, a demand for international preliminary examination has already been submitted, the applicant must preferably, at the same time of filing the amendments with the International Bureau, also file a copy of such amendments with the International Preliminary Examining Authority (see Rule 62.2(a), first sentence).

Consequence with regard to translation of the international application for entry into the national phase

The applicant's attention is drawn to the fact that, where upon entry into the national phase, a translation of the claims as amended under Article 19 may have to be furnished to the designated/elected Offices, instead of, or in addition to, the translation of the claims as filed.

For further details on the requirements of each designated/elected Office, see Volume II of the PCT Applicant's Guide.

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PCT REQUEST

The undersigned requests that the present international application be processed according to the Patent Cooperation Treaty.

For receiving Office use only

International Application No.

International Filing Date

Name of receiving Office and "PCT International Application"

Applicant's or agent's file reference
(if desired)(12 characters maximum) **CE50059P/PCT**

Box No. I TITLE OF INVENTION
MOBILE STATION, RADIO TELECOMMUNICATION SYSTEM AND METHODS FOR OPERATING RADIO TELECOMMUNICATIONS SYSTEMS

Box No. II APPLICANT

Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country. The country of the address indicated in this Box is the applicant's State (that is, country) of residence if no State of residence is indicated below.)

Motorola Limited
Jays Close, Viabes Industrial Estate
Basingstoke, Hampshire, RG22 4PD
United Kingdom

☐ This person is also inventor.

Telephone No. **44 1256 358211**

Facsimile No.

Teleprinter No.

State (i.e. country) of nationality: **GB**

State (i.e. country) of residence: **GB**

This person is applicant ☐ all designated ☐ all designated States except ☐ the United States ☐ the States indicated for the purposes of: States the United States of America of America only in the Supplemental Box

Box No. III FURTHER APPLICANTS AND/OR (FURTHER) INVENTORS

Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country. The country of the address indicated in this Box is the applicant's State (that is, country) of residence if no State of residence is indicated below.)

ANDERSEN, Neils Peter Skov
Lovparken 14, DK-4000
Roskilde, Denmark

This person is:

- ☐ applicant only
☐ applicant and inventor
☐ inventor only (if this check-box is marked, do not fill in below.)

State (i.e. country) of nationality: **DK**

State (i.e. country) of residence: **DK**

This person is applicant ☐ all designated ☐ all designated States except ☐ the United States ☐ the States indicated for the purposes of: States the United States of America of America only in the Supplemental Box

☐ Further applicants and/or (further) inventors are indicated on a continuation sheet.

Box No. IV AGENT OR COMMON REPRESENTATIVE; OR ADDRESS FOR CORRESPONDENCE

The person identified below is hereby/has been appointed to act on behalf

of the applicant(s) before the competent International Authorities as: ☒ agent ☐ common representative

Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country)

MORGAN, Marc
Motorola European Intellectual Property Operations
Midpoint, Alencon Link, Basingstoke
Hampshire, RG21 7PL, United Kingdom

Telephone No.
01256 790073

Facsimile No.
01256 811319

Teleprinter No.

☐ Address for correspondence: Mark this check-box where no agent or common representative is/has been appointed and the space above is used instead to indicate a special address to which correspondence should be sent.

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Continuation of Box No. III		FURTHER APPLICANTS AND/OR (FURTHER) INVENTORS	
<i>If none of the following sub-boxes is used, this sheet is not to be included in the request.</i>			
Name and address: (Family name followed by given name: for a legal entity, full official designation. The address must include postal code and name of country. The country of the address indicated in this Box is the applicant's State (that is, country) of residence if no State of residence is indicated below.)		This person is: <input type="checkbox"/> Applicant only <input type="checkbox"/> applicant and inventor <input type="checkbox"/> inventor only (if this check-box is marked, do not fill in below.)	
State (i.e. country) of nationality:		State (i.e. country) of residence:	
This person is applicant <input type="checkbox"/> all designated <input type="checkbox"/> all designated States except <input checked="" type="checkbox"/> the United States <input type="checkbox"/> the States indicated for the purposes of: States the United States of America of America only in the Supplemental Box			
Name and address: (Family name followed by given name: for a legal entity, full official designation. The address must include postal code and name of country. The country of the address indicated in this Box is the applicant's State (that is, country) of residence if no State of residence is indicated below.)		This person is: <input type="checkbox"/> applicant only <input type="checkbox"/> applicant and inventor <input type="checkbox"/> inventor only (if this check-box is marked, do not fill in below.)	
State (i.e. country) of nationality:		State (i.e. country) of residence:	
This person is applicant <input type="checkbox"/> all designated <input type="checkbox"/> all designated States except <input type="checkbox"/> the United States <input type="checkbox"/> the States indicated for the purposes of: States the United States of America of America only in the Supplemental Box			
Name and address: (Family name followed by given name: for a legal entity, full official designation. The address must include postal code and name of country. The country of the address indicated in this Box is the applicant's State (that is, country) of residence if no State of residence is indicated below.)		This person is: <input type="checkbox"/> Applicant only <input type="checkbox"/> applicant and inventor <input type="checkbox"/> inventor only (if this check-box is marked, do not fill in below.)	
State (i.e. country) of nationality:		State (i.e. country) of residence:	
This person is applicant <input type="checkbox"/> all designated <input type="checkbox"/> all designated States except <input type="checkbox"/> the United States <input type="checkbox"/> the States indicated for the purposes of: States the United States of America of America only in the Supplemental Box			
Name and address: (Family name followed by given name: for a legal entity, full official designation. The address must include postal code and name of country. The country of the address indicated in this Box is the applicant's State (that is, country) of residence if no State of residence is indicated below.)		This person is: <input type="checkbox"/> Applicant only <input type="checkbox"/> applicant and inventor <input type="checkbox"/> inventor only (if this check-box is marked, do not fill in below.)	
State (i.e. country) of nationality:		State (i.e. country) of residence:	
This person is applicant <input type="checkbox"/> all designated <input type="checkbox"/> all designated States except <input type="checkbox"/> the United States <input type="checkbox"/> the States indicated for the purposes of: States the United States of America of America only in the Supplemental Box			

☐ Further applicants and/or (further) inventors are indicated on a continuation sheet.

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Box No. V DESIGNATION OF STATES

The following designations are hereby made under Rule 4.9(a) (mark the applicable check-boxes; at least one must be marked):

Regional Patent

- ☐ AP ARIPO Patent: GH Ghana, GM Gambia, KE Kenya, LS Lesotho, MW Malawi, SD Sudan, SZ Swaziland, UG Uganda, ZW Zimbabwe, and any other State which is a Contracting State of the Harare Protocol and of the PCT
- ☐ EA Eurasian Patent: AM Armenia, AZ Azerbaijan, BY Belarus, KG Kyrgyzstan, KZ Kazakhstan, MD Republic of Moldova, RU Russian Federation, TJ Tajikistan, TM Turkmenistan, and any other State which is a Contracting State of the Eurasian Patent convention and of the PCT.
- ☒ EP European Patent: AT Austria, BE Belgium, CH and LI Switzerland and Liechtenstein, CY Cyprus, DE Germany, DK Denmark, ES Spain, FI Finland, FR France, GB United Kingdom, GR Greece, IE Ireland, IT Italy, LU Luxembourg, MC Monaco, NL Netherlands, PT Portugal, SE Sweden, and any other State which is a Contracting State of the European Patent Convention and of the PCT
- ☐ OA OAPI Patent: BF Burkina Faso, BJ Benin, CF Central African Republic, CG Congo, CI Côte d'Ivoire, CM Cameroon, GA Gabon, GN Guinea, ML Mali, MR Mauritania, NE Niger, SN Senegal, TD Chad, TG Togo, and any other State which is a member State of OAPI and a Contracting State of the PCT (if other kind of protection or treatment desired, specify on dotted line).....

National Patent (if other kind of protection or treatment desired, specify on dotted line):

- | | |
|--|--|
| <input type="checkbox"/> AL Albania..... | <input type="checkbox"/> LS Lesotho..... |
| <input type="checkbox"/> AM Armenia..... | <input type="checkbox"/> LT Lithuania..... |
| <input type="checkbox"/> AT Austria..... | <input type="checkbox"/> LU Luxembourg..... |
| <input checked="" type="checkbox"/> AU Australia..... | <input type="checkbox"/> LV Latvia..... |
| <input type="checkbox"/> AZ Azerbaijan..... | <input type="checkbox"/> MD Republic of Moldova..... |
| <input type="checkbox"/> BA Bosnia and Herzegovina..... | <input type="checkbox"/> MG Madagascar..... |
| <input type="checkbox"/> BB Barbados..... | <input type="checkbox"/> MK The former Yugoslav Republic of Macedonia..... |
| <input type="checkbox"/> BG Bulgaria..... | <input type="checkbox"/> MN Mongolia..... |
| <input type="checkbox"/> BR Brazil..... | <input type="checkbox"/> MW Malawi..... |
| <input type="checkbox"/> BY Belarus..... | <input type="checkbox"/> MX Mexico..... |
| <input checked="" type="checkbox"/> CA Canada..... | <input type="checkbox"/> NO Norway..... |
| <input type="checkbox"/> CH and LI Switzerland and Liechtenstein..... | <input type="checkbox"/> NZ New Zealand..... |
| <input type="checkbox"/> CN China..... | <input type="checkbox"/> PL Poland..... |
| <input type="checkbox"/> CU Cuba..... | <input type="checkbox"/> PT Portugal..... |
| <input type="checkbox"/> CZ Czech Republic..... | <input type="checkbox"/> RO Romania..... |
| <input type="checkbox"/> DE Germany..... | <input type="checkbox"/> RU Russian Federation..... |
| <input type="checkbox"/> DK Denmark..... | <input type="checkbox"/> SD Sudan..... |
| <input type="checkbox"/> EE Estonia..... | <input type="checkbox"/> SE Sweden..... |
| <input type="checkbox"/> ES Spain..... | <input checked="" type="checkbox"/> SG Singapore..... |
| <input type="checkbox"/> FI Finland..... | <input type="checkbox"/> SI Slovenia..... |
| <input type="checkbox"/> GB United Kingdom..... | <input type="checkbox"/> SL Sierra Leone..... |
| <input type="checkbox"/> GE Georgia..... | <input type="checkbox"/> SK Slovakia..... |
| <input type="checkbox"/> GH Ghana..... | <input type="checkbox"/> TJ Tajikistan..... |
| <input type="checkbox"/> GM Gambia..... | <input type="checkbox"/> TM Turkmenistan..... |
| <input type="checkbox"/> GW Guinea-Bissau..... | <input type="checkbox"/> TR Turkey..... |
| <input type="checkbox"/> HR Croatia..... | <input type="checkbox"/> TT Trinidad and Tobago..... |
| <input type="checkbox"/> HU Hungary..... | <input type="checkbox"/> UA Ukraine..... |
| <input type="checkbox"/> ID Indonesia..... | <input type="checkbox"/> UG Uganda..... |
| <input type="checkbox"/> IL Israel..... | <input checked="" type="checkbox"/> US United States of America..... |
| <input type="checkbox"/> IS Iceland..... | <input type="checkbox"/> UZ Uzbekistan..... |
| <input type="checkbox"/> JP Japan..... | <input type="checkbox"/> VN Viet Nam..... |
| <input type="checkbox"/> KE Kenya..... | <input type="checkbox"/> YU Yugoslavia..... |
| <input type="checkbox"/> KG Kyrgyzstan..... | <input type="checkbox"/> ZW Zimbabwe..... |
| <input type="checkbox"/> KP Democratic People's Republic of Korea..... | |
| <input type="checkbox"/> KR Republic of Korea..... | |
| <input type="checkbox"/> KZ Kazakhstan..... | |
| <input type="checkbox"/> LC Saint Lucia..... | |
| <input type="checkbox"/> LK Sri Lanka..... | |
| <input type="checkbox"/> LR Liberia..... | |

Check-boxes reserved for designating States (for the purposes of a national patent) which have become party to the PCT after issuance of this sheet:

- ☐
- ☐
- ☐

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Supplemental Box

If the Supplemental Box is not used, this sheet should not be included in the request.

1. If, in any of the Boxes, the space is insufficient to furnish all the information: in such case, write "Continuation of Box No. ..." [indicate the number of the Box] and furnish the information in the same manner as required according to the captions of the Box in which the space was insufficient, in particular:

- (i) if more than two persons are involved as applicants and/or inventors and no "continuation sheet" is available: in such case, write "Continuation of Box No. III" and indicate for each additional person the same type of information as required in Box No. III. The country of the address indicated in this Box is the applicant's State (that is, country) of residence if no State of residence is indicated below;
 - (ii) if, in Box No. II or in any of the sub-boxes of Box No. III, the indication "the States indicated in the Supplemental Box" is checked: in such case, write "Continuation of Box No. II" or "Continuation of Box No. III" or "Continuation of Boxes No. II and No. III" (as the case may be), indicate the name of the applicant(s) involved and, next to (each) such name, the State(s) (and/or, where applicable, ARIPO, Eurasian, European or OAPI patent) for the purposes of which the named person is applicant;
 - (iii) if, in Box No. II or in any of the sub-boxes of Box No. III, the inventor or the inventor/applicant is not inventor for the purposes of all designated States or for the purposes of all designated States of America: in such case, write "Continuation of Box No. II" or "Continuation of Box No. III" or "Continuation of Boxes No. II and No. III" (as the case may be), indicate the name of the inventor(s) and, next to (each) such name, the State(s) (and/or, where applicable, ARIPO, Eurasian, European or OAPI patent) for the purposes of which the named person is inventor;
 - (iv) if, in addition to the agent(s) indicated in Box No. IV, there are further agents: in such case, write "Continuation of Box No. IV" and indicate for each further agent the same type of information as required in Box No. IV;
 - (v) if, in Box No. V, the name of any State (or OAPI) is accompanied by the indication "patent of addition," or "certificate of addition," or if, in Box No. V, the name of the United States of America is accompanied by an indication "continuation" or "Continuation-in-part": in such case, write "Continuation of Box No. V" and the name of each State involved (or OAPI), and after the name of each such State (or OAPI), the number of the parent title or parent application and the date of grant of the parent title or filing of the parent application;
 - (vi) if, in Box No. VI, there are more than three earlier applications whose priority is claimed: in such case, write "Continuation of Box No. VI" and indicate for each additional earlier application the same type of information as required in Box No. VI.
 - (vii) if, in Box No. VI, the earlier application is an ARIPO application: in such case, write "Continuation of Box No. VI", specify the number of the item corresponding to that earlier application and indicate at least one country party to the Paris Convention for the Protection of Industrial Property for which that earlier application was filed.
2. If, with regard to the precautionary designation statement contained in Box No. V, the applicant wishes to exclude any State(s) from the scope of that statement: in such case, write "Designation(s) excluded from precautionary designation statement" and indicate the name or two-letter code of each State so excluded
3. If the applicant claims, in respect of any designated Office, the benefits of provisions of the national law concerning **non-prejudicial disclosures or exceptions to lack of novelty**: in such case, write "Statement concerning non-prejudicial disclosures or exceptions to lack of novelty" and furnish that statement below

Continuation of Box No. IV

TRELEVEN, Colin
GIBSON, Sarah
POTTS, Susan
LITCHFIELD, Laura
MORGAN, Marc

All above attorneys/agents are members of Motorola, Ltd., Intellectual Property
Department and have the same address, telephone number and telegraphic address
As indicated in Box IV.

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Box No. VI PRIORITY CLAIM		Further priority claims are indicated in the Supplemental Box <input type="checkbox"/>	
Priority of the following earlier application(s) is claimed:		Office where earlier application filed	
Filing Date of earlier application (day/month/year)	Number of earlier application	National application = country; Regional application = regional Office	International application = Receiving Office
item (1) 29 October 1999 29.10.99	9925613.3	GB	
item (2)			
item (3)			

☐ The receiving Office is requested to prepare and transmit to the International Bureau a certified copy of the earlier application(s) (only if the earlier application was filed with the Office which for the purposes of the present international application is the receiving Office) identified above as item(s):

* Where the earlier application is an ARIPO application, it is mandatory to indicate in the Supplemental Box at least one country party to the Paris Convention for the Protection of Industrial Property for which that earlier application was filed (Rule 4.10(b)(ii). See Supplemental Box.

Box No. VII INTERNATIONAL SEARCHING AUTHORITY

Choice of International Searching Authority (ISA) (if two or more International Searching Authorities are competent to carry out the international search, indicate the Authority chosen; the two-letter code may be used): ISA/ EP

Request to use results of earlier search; reference to that search (if an earlier search has been carried out by or requested from the International Searching Authority):

Date (day/month/year) _____ Number: _____ Country (or regional office): _____

Box No. VIII CHECK LIST; LANGUAGE OF FILING

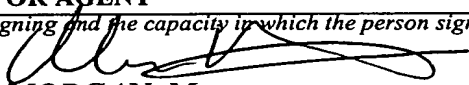
This international application contains the following number of sheets: 1. request : 5 sheets 2. description (excluding sequence listing part) : 19 sheets 3. claims : 13 sheets 4. abstract : 1 sheets 5. drawings : 3 sheets 6. sequence listing part of description : _____ sheets Total : <u>41</u> sheets	This international application is accompanied by the item(s) marked below: 1. <input type="checkbox"/> fee calculation sheet 2. <input type="checkbox"/> separate signed power of attorney 3. <input type="checkbox"/> copy of general power of attorney 4. <input type="checkbox"/> statement explaining lack of signature 5. <input type="checkbox"/> priority document(s) identified in Box No. VI as item(s): _____ 6. <input type="checkbox"/> translation of international application into (language): _____ 7. <input type="checkbox"/> separate indications concerning deposited microorgs./biological mat. 8. <input type="checkbox"/> nucleotide and/or amino acid sequence listing in computer readable form 9. <input type="checkbox"/> other (specify): copy, U.S. assignment
---	--

Figure No. 3 of the drawings (if any) should accompany the abstract when it is published.

Language of filing of the international application: EN

Box No. IX SIGNATURE OF APPLICANT OR AGENT

Next to each signature, indicate the name of the person signing and the capacity in which the person signs (if such capacity is not obvious from reading the request).


MORGAN, Marc

For receiving Office use only

1. Date of actual receipt of the purported international application: 3. Corrected date of actual receipt due to later but timely received papers or drawings completing the purported international application: 4. Date of timely receipt of the required corrections under PCT Article II(2): 5. International Searching Authority specified by the applicant: <u>ISA/</u>	2. Drawings: <input type="checkbox"/> received: <input type="checkbox"/> not received: 6. <input type="checkbox"/> Transmittal of search copy delayed until search fee is paid
--	---

For International Bureau use only

Date of receipt of the record copy by the International Bureau:	
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PCT

FEE CALCULATION SHEET

Annex to the Request

Applicant's or agent's file reference CE50039P/PCT		International application No. _____ Date Stamp of the receiving Office _____	
Applicant MOTOROLA LIMITED			
CALCULATION OF PRESCRIBED FEES			
1.	TRANSMITTAL FEE	199.49 DM	[T]
2.	SEARCH FEE International search to be carried out by <u>ISA/ EP</u> <i>(If two or more International Searching Authorities are competent in relation to the international application, indicate the name of the Authority which is chosen to carry out the international search.)</i>	1848.26 DM	[S]
3.	INTERNATIONAL FEE Basic Fee The international application contains <u>18</u> sheets. first 30 sheets 799.93 [b₁] <div style="display: flex; justify-content: space-between; align-items: center;"> <u>0</u> X _____ = <u>0</u> [b₂] </div> <div style="display: flex; justify-content: space-between;"> remaining sheets additional amount </div> Add amounts entered at b ₁ and b ₂ and enter total at B [B] Designation Fees <div style="display: flex; justify-content: space-between; align-items: center;"> <u>8</u> X <u>172.11</u> 1721.10 DM [D] </div> <div style="display: flex; justify-content: space-between;"> number of designations payable (maximum 10) amount of designation fee </div> Add amounts entered at B and D and enter total as I 2521.03 DM [I] <i>(Applicants from certain States are entitled to a reduction of 75% of the international fee. Where the applicant is (or all applicants are) so entitled the total to be entered at I is 25% of the sum of the amounts entered at B and D.)</i>		
4.	FEE FOR PRIORITY DOCUMENT (if applicable)	0	[P]
5.	TOTAL FEES PAYABLE Add amounts entered at T, S, I and P, and enter total in the TOTAL box	4568.78 DM	[TOTAL]
<input type="checkbox"/> The designation fees are not paid at this time.			
MODE OF PAYMENT			
<div style="display: flex; flex-wrap: wrap;"> <div style="width: 33%;"> <input checked="" type="checkbox"/> authorization to charge deposit account (see below) </div> <div style="width: 33%;"> <input type="checkbox"/> bank draft </div> <div style="width: 33%;"> <input type="checkbox"/> coupons </div> <div style="width: 33%;"> <input type="checkbox"/> cheque </div> <div style="width: 33%;"> <input type="checkbox"/> cash </div> <div style="width: 33%;"> <input type="checkbox"/> other (specify): _____ </div> <div style="width: 33%;"> <input type="checkbox"/> postal money order </div> <div style="width: 33%;"> <input type="checkbox"/> revenue stamps </div> </div>			
DEPOSIT ACCOUNT AUTHORIZATION			
The RO/ <u>EP</u> <input checked="" type="checkbox"/> is hereby authorized to charge the total fees indicated above to my deposit account <input checked="" type="checkbox"/> is hereby authorized to charge any deficiency or credit any overpayment in the total fees indicated above to my deposit account. <input checked="" type="checkbox"/> is hereby authorized to charge the fee for preparation and transmittal of the priority document to the International Bureau of WIPO to my deposit account.			
28050071 Deposit Account Number		11 05 2000 Date (day/month/year)	
Form PCT/RO/101 (Annex) (July 1998)		<div style="text-align: right;"> Signature MORGAN, Marc <i>See Notes to the fee calculation sheet</i> </div>	

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10/070068

JC Rec'd PCT/PTO 04 MAR 2002

PATENT APPLICATION

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICANTS: Motorola, Inc INT'L APPLICATION NO: PCT/EP00/10199
CASE NO.: CE50039P--ANDERSEN INT'L FILE DATE: 16 OCTOBER 2000
ENTITLED: MOBILE STATION, RADIO TELECOMMUNICATION SYSTEM AND
METHODS FOR OPERATING RADIO TELECOMMUNICATIONS
SYSTEMS

Motorola, Inc.
Corporate Offices
1303 E. Algonquin Road
Schaumburg, IL 60196
March 4, 2002

CERTIFICATE OF EXPRESS MAILING / FILING UNDER 35 U.S.C. 371

COMMISSIONER OF PATENTS
& TRADEMARKS
BOX PCT
Washington D.C. 20231

Sir:

I certify that the above-referenced FILING UNDER 35 U.S.C. 371 was deposited,
postage prepaid, as Express Mail having the mailing label number written below with the
United States Postal Service addressed to:

COMMISSIONER OF PATENTS
& TRADEMARKS
BOX PCT
Washington D.C. 20231

on Monday, March 4, 2002

By: Candace Wasm

Date: March 4, 2002

Mailing Label No.: ET 861520681 US

2019 : 0.04

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PATENT COOPERATION TREATY

PCT

INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference CE50039P/PCT	FOR FURTHER ACTION <small>see Notification of Transmittal of International Search Report (Form PCT/ISA/220) as well as, where applicable, item 5 below.</small>	
International application No. PCT/EP 00/ 10199	International filing date (day/month/year) 16/10/2000	(Earliest) Priority Date (day/month/year) 29/10/1999
Applicant MOTOROLA LIMITED		

This International Search Report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This International Search Report consists of a total of 2 sheets.

☒ It is also accompanied by a copy of each prior art document cited in this report.

1. Basis of the report

a. With regard to the **language**, the international search was carried out on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.

☐ the international search was carried out on the basis of a translation of the international application furnished to this Authority (Rule 23.1(b)).

b. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international search was carried out on the basis of the sequence listing :

☐ contained in the international application in written form.

☐ filed together with the international application in computer readable form.

☐ furnished subsequently to this Authority in written form.

☐ furnished subsequently to this Authority in computer readable form.

☐ the statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.

☐ the statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished

2. ☐ **Certain claims were found unsearchable** (See Box I).

3. ☐ **Unity of invention is lacking** (see Box II).

4. With regard to the **title**,

☒ the text is approved as submitted by the applicant.

☐ the text has been established by this Authority to read as follows:

5. With regard to the **abstract**,

☒ the text is approved as submitted by the applicant.

☐ the text has been established, according to Rule 38.2(b), by this Authority as it appears in Box III. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority.

6. The figure of the **drawings** to be published with the abstract is Figure No.

☒ as suggested by the applicant.

☐ because the applicant failed to suggest a figure.

☐ because this figure better characterizes the invention.

3

☐ None of the figures.

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INTERNATIONAL SEARCH REPORT

Int. l. Application No

P. P 00/10199

A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 H04Q7/32

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 H04Q

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, WPI Data, PAJ, INSPEC

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 98 42152 A (SBC TECHN RES INC) 24 September 1998 (1998-09-24) page 15, line 6 - line 18 page 36, line 6 -page 37, line 27 page 42, line 11 -page 43, line 5 ---	1-65
X	WO 99 43181 A (BELLSOUTH INTELLECT PTY CORP) 26 August 1999 (1999-08-26) page 11, line 14 - line 26 page 13, line 4 - line 10 page 14, line 9 -page 15, line 8 page 16, line 10 - line 29 ---	1-65
P, A	WO 00 36853 A (NOKIA NETWORKS OY ;FRIMAN LEIF (FI)) 22 June 2000 (2000-06-22) page 4, line 18 - line 20 page 9, line 6 -page 10, line 3 -----	1-65

☐ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

* Special categories of cited documents :

- *A* document defining the general state of the art which is not considered to be of particular relevance
- *E* earlier document but published on or after the international filing date
- *L* document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- *O* document referring to an oral disclosure, use, exhibition or other means
- *P* document published prior to the international filing date but later than the priority date claimed

- *T* later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
- *X* document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
- *Y* document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.
- * & * document member of the same patent family

Date of the actual completion of the international search

22 February 2001

Date of mailing of the international search report

01/03/2001

Name and mailing address of the ISA

European Patent Office, P.B. 5818 Patentlaan 2
NL - 2280 HV Rijswijk
Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,
Fax: (+31-70) 340-3016

Authorized officer

Heinrich, D

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/EP 00/10199

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO 9842152 A	24-09-1998	US 5950130 A EP 0968617 A	07-09-1999 05-01-2000
WO 9943181 A	26-08-1999	AU 2315899 A EP 1057358 A	06-09-1999 06-12-2000
WO 0036853 A	22-06-2000	FI 982726 A AU 1985700 A	17-06-2000 03-07-2000